Remarks

Applicants appreciate the telephonic interview conducted August 26, 2004 and respectfully submit the following remarks.

Rejection of claims 1 and 3-4 under 35 U.S.C. 102(b) as anticipated by Zanakis et al.

The Examiner has rejected claims 1 and 3-4 under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 5,433,735 to Zanakis et al. ("Zanakis" hereafter). The Examiner contends Zanakis shows a method of increasing angiogenesis in a muscle tissue by applying an electrical voltage to the tissue wherein the voltage does not cause contraction of the muscle, and wherein angiogenesis is induced after application of the electrical voltage. For the following reasons, Applicants respectfully disagree.

Zanakis does not in any way disclose the use of electrical voltages that do not cause contraction of muscle and induce angiogenesis. The only mention of voltages by Zanakis is in column 1, lines 32-34, wherein it is disclosed that the voltage of the electrical stimulation utilized therein is usually about 1.5 volts. The stated purpose of this voltage is to avoid electrolysis and the resultant release of gas. Zanakis does not disclose or even consider the effect of electrical stimulation on muscle contraction. Applicants further point out that, throughout the specification, Zanakis emphasizes the effect of the technique disclosed therein as influencing the orientation of existing cells. In particular, in column 5, lines 52-59, Zanakis argues that events related to reperfusion by vasculature may be enhanced by inducing proper cell alignment. However, Zanakis provides no demonstration that application of electrical stimulation that does not cause muscle contraction in any way induces angiogenesis. Applicants therefore respectfully assert that Zanakis does not anticipate claim 1 of the present application, or its dependent claims 3 and 4.

In contrast to Zanakis, the present invention claims the use of electrical stimulation that does not cause muscle contraction and induces angiogenesis. This is illustrated in the specification on page 6, lines 6-16, where it is indicated that application of 0.1 volts to rat TA muscle was sufficient to stimulate angiogenesis and was about 10% of the threshold for inducing contraction of this muscle. Further, on page 13, lines 25-30, and Figures 7 and 8, data is

presented that demonstrates the technique of the present invention induces angiogenesis by causing an increase of capillary density in stimulated muscle by application of electrical voltage that does not cause the muscle to contract.

Rejection of claim 2 under 35 U.S.C. 103(a) as unpatentable over Zanakis et al.

The Examiner contends that Zanakis discloses the claimed invention except for the electrical voltage being 0.1V at 50Hz. The Examiner asserts that Applicants have not disclosed that this particular voltage and frequency provides any criticality, and it appears that the invention would perform equally well with any voltage and frequency, such as the voltage and frequency taught by Zanakis.

In response, Applicants reiterate the arguments presented above and point out that Zanakis does not disclose, teach or suggest inducing angiogenesis by application of electrical voltage that does not cause contraction of muscle. Therefore, Zanakis does not render claim 2 obvious.

Rejection of claim 4 under 35 U.S.C. 103(a) as unpatentable over Zanakis et al.

The Examiner contends that Zanakis fails to specifically point out that muscle cells are cardiac muscle cells, but because Zanakis teaches that it is an object of the invention disclosed therein to promote blood infusion in damaged tissues, it would have been an obvious design choice to include cardiac muscle cells in the method of Zanakis because cardiac muscle cells are subject to ischemia. However, Applicants again point out that Zanakis does not disclose, teach or suggest inducing angiogenesis by application of electrical stimulation that does not cause contraction of muscle. Applicants further point out the effects of electrical stimulation on muscle contraction are important to consider when electrical stimulation is applied to cardiac muscle to induce angiogenesis.

Accordingly, because the disclosure of Zanakis does not in any way teach, suggest or motivate inducing angiogenesis by application of electrical stimulation that does not induce

contraction of muscle, Applicants respectfully assert that Zanakis does not render claim 4 obvious.

Conclusion

Based on the above arguments, Applicants believe that claims 1-15 are in condition for allowance and therefore respectfully request the Examiner to allow all the claims.

Applicants request a two-month extension of time to respond to the Office Action and have accordingly enclosed a check in the amount of $210. If any additional fee is due it may be charged to deposit account number 08-2442.

Respectfully submitted,
HODGSON RUSS LLP

By _____
John D. Lopinski, Ph.D., Reg. No. 50,846

Hodgson Russ LLP
One M&T Plaza, Suite 2000
Buffalo, New York 14203-2391
(716) 848-1430
Dated: August 31, 2004